8 Overview of Current Research Efforts

8.1 Weekend/Weekday Ozone Observations in the South Coast Air Basin - Desert Research Institute & Sonoma Technology, Inc. for National Renewable Energy Laboratory

8.1.1 Summary of workplan

PHASE I: Retrospective Analysis of Ambient and Emissions Data and Refinement of Hypotheses

Task 1: Review available emissions data. (STI)

Based on available emission inventory data, identify VOC and NO_X sources with potential to be different on weekends than on weekdays.

Summarize diurnal variations in daily ROG and NO_X emissions by day-of-week for these sources

Review the method(s) used to determine temporal variations and evaluate uncertainties

Identify alternative methods or additional data available to update and improve existing temporal allocation of ROG and NO_x emissions

Task 2: Analyze retrospective ozone and ozone precursors and ozone episodes. (DRI)

Characterize and classify evolution of temporal and spatial patterns of O_3, CO, total NMHC, carbonyl compounds, NO_X, and NMHC/ NO_X ratios from Thursday to Monday during the summers of 1995-1998 by meteorological conditions.

Task 3: Review source apportionment analyses. (DRI)

Review the source apportionment analysis conducted by the Desert Research Institute for SoCAB PAMS data (1994-97) for weekend days and weekdays.

Review available source composition profiles and identify source for which updated profiles are needed.

Task 4: Analyze SCOS97-NARSTO meteorological and 3-D ozone data. (STI)

Evaluate meteorological conditions during SCOS97-NARSTO intensive operational periods (IOPs) to determine applicability of weekend IOPs for assessments of the weekend effect.

Characterize the surface and aloft spatial and temporal patterns of ozone and ozone precursors during weekend IOPs.

Analyze the data from the SCOS97 upper-air meteorological network and evaluate the regional representativeness of the temporal and spatial variations in wind and mixing heights that can be obtained from the two PAMS profilers (at LAX and Ontario) alone.

Task 5: Synthesize Phase I data analysis and prepare Phase 1 Report (DRI and STI)

Summarize results of phase I data analysis, revise conceptual model, update hypotheses, and finalize field measurement program.

Submit draft report for Phase I in April 2000.

PHASE II: Summer 2000 Field Measurements Program

Task 6: Conduct field measurements (DRI)

Continuous NOy and NOy* (NOy-HNO$_3$) at Pico Rivera, Azusa, and Upland.

Continuous total NMHC by TEI 55 at Azusa and Upland.

Continuous CO by TEI 48C-TL (LOD = 0.4 ppb) at Pico Rivera, Azusa, and Upland. The District typically reports CO to the nearest ppm.

Continuous light absorption by aethalometer at Pico Rivera, Azusa and Upland.

DRI comparison with speciated NMHC from the SCAQMD auto-GC and TEI 55.

Optional:

elemental and organic carbon by R&P carbon analyzer or automated Thermal Optical Reflectance at Pico Rivera and Upland.

Continuous PM mass by at Pico Rivera, Azusa and Upland.

Supplemental canister and DNPH samples at Upland during weekends (Friday-Sunday) to fill in the PAMS every third day sampling. Collect a total of up to 72 canister and 72 DNPH cartridge samples.

NO$_2$ and PAN

Continuous HCHO

Task 7: Update and improve source composition profiles (DRI)

Collect additional VOC source composition profiles identified in Task 1 and 4.

Conduct saturation monitoring near epicenter of non-mobile VOC source to determine source composition and zone of influence.

Task 8: Update and improve temporally and spatially-resolved activity factors (STI)

Gather and compile existing information and new data that will support weekend-weekday comparisons of emissions as determined in the plan developed in Phase I.

Task 9: Compile and validate data (STI)

Compile and validate the SCAQMD's PAMS VOC data; NO_X, CO, and ozone data; and upper-air data collected during the ozone seasons of 1999 and 2000.

PHASE III: Data Analysis and Final Report

Task 10: Analyze temporal and spatial variations in O_3, VOC, NO_X and related air quality and meteorological parameters (DRI)

Task 11: Analyze PAMS upper-air meteorological data (STI)

Objective: Determine applicability of each weekend exceedance for assessments of the weekend effect

Approach: Use available meteorological data, including upper-air data from LAX and Ontario, to evaluate meteorological conditions and mixing heights during the weekend exceedances

Task 12: Update source apportionment analysis (DRI)

Task 13: Analyze activity data (STI)

Objective: Test hypotheses that may explain differences in weekday-weekend ozone levels in the SoCAB

Approach: Use emissions-related activity data compiled during the first two phases to perform statistical analyses of differences between emissions-related activity patterns on weekdays and weekends

Task 14: Update EKMA analysis (DRI)

Task 15: Evaluate SCOS97-NARTSO model sensitivity results (STI)

Evaluate modeling results to see if they are consistent with the results of other analyses.

Review and select a base case for SoCAB modeling from the CRC-sponsored weekday/weekend modeling to be performed using SCOS97 data or from modeling performed by the ARB or the SCAQMD.

Evaluate the results for consistency (or inconsistency) with the results from other analysis methods.

Task 16: Synthesize results and prepare the final report (DRI and STI)

8.1.2 **Final report** (completed June 12, 2002 under CRC contract E-53.) available at: **http://www.arb.ca.gov/aqd/weekendeffect/weekendeffect.htm**